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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,431	11/13/2001	Thomas E. Schmoyer	SulfoTech P-301	3034
7590	10/01/2003		EXAMINER	
Cargill & Associates 56 Macomb Place Mt. Clemens, MI 48043			LUND, JEFFRIE ROBERT	
			ART UNIT	PAPER NUMBER
			1763	
			DATE MAILED: 10/01/2003	

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/008,431	SCHMOYER, THOMAS E.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jeffrie R. Lund	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-7,9-13,15-20,22-25,27-34 and 36-45 is/are pending in the application.
- 4a) Of the above claim(s) 22-25, 27-34, 36-43, 45 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-7,9-13,15-20 and 44 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 13 November 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-7, 9-13, 15-20 and 44, drawn to an apparatus for sulfonating the surface of an article, classified in class 118, subclass 715.
  - II. Claims 22-25, 27-34, 27-34, 36-43, and 45 drawn to a method of sulfonating the surface of an article, classified in class 427, subclass 255.28.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group II and Group I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus as claimed can be used to practice another and materially different process such as etching.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Lynn E. Cargill on May 15, 2003 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-7, 9-13, 15-20, and 44. Affirmation of this election must be made by applicant in replying to this Office action. Claims 22-25, 27-34, 36-43, and 45 withdrawn from

further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Objections***

5. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 43 and 44 have been renumbered 44 and 45.

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 requires a manifold means "for containing and transporting the sulfonating gas between the multiple ports of the gas delivery system so that the unused sulfonating gas can be recycled and delivered to additional polymeric articles for more of the elemental sulfur to be consumed by forming a treatment layer on more of the articles." The phrase is indefinite because it does not particularly point out and distinctly claim the subject matter which applicant regards as the invention, specifically, it is not possible to recycle the sulfonating gas without first supplying the sulfonating

gas. The claim needs to be amended to include first supplying the sulfonating gas to the gas delivery system and then recycling the unused sulfonating gas.

Claim 20 recites the limitation "at least one inlet" in line 1. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Donald et al, 3,684,554.

Donald et al teaches the claimed invention in figure 1 and throughout the specification.

10. Claims 1, 2, 4, 6, and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Walles et al, 4,915,912.

Walles et al teaches the claimed invention in figure 3 and in column 9 lines 4-66.

11. Claims 1-4 and 7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Walles et al, 5,030,399.

Walles et al teaches the claimed invention in the figure and throughout the specification.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walles et al, US Patent 4,915,912, in view of Cameron, US Patent 5,308,587, and Bell et al, US Patent 5,229,077.

Walles et al teaches an apparatus for sulfonating the surface of an article that includes: an enclosable container 14; a gas inlet to the enclosable container; an on-site and on-demand sulfonating gas generator 12 using a chemical feed stock of sulfur trioxide 26; a dry air inlet 29; and a pump 36. (Figure 3 and column 9 lines 4-66)

Walles et al differs from the present invention in that Walles et al does not teach that the sulfur trioxide ( $\text{SO}_3$ ) gas generator includes a vanadium catalytic converter.

Cameron teaches a  $\text{SO}_3$  gas generator that produces  $\text{SO}_2$  in a furnace 12 and then converts the  $\text{SO}_2$  to  $\text{SO}_3$  through a catalytic converter 240 (figure 3 and the abstract). Cameron does not specify a specific type of catalytic converter.

Bell et al teaches a catalytic converter 54 that uses a bed of vanadium pentoxide to convert  $\text{SO}_2$  to  $\text{SO}_3$ .

The motivation for replacing the gas generator of Walles et al with the gas generator of Cameron is to provide an alternate and equivalent means of generating  $\text{SO}_3$ . The motivation for using the catalytic converter of Bell et al in the apparatus of

Cameron is to provide a specific catalytic converter as required by Cameron but only generically taught.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the gas generator of Walles et al with the gas generator with a catalytic converter of Cameron, and to use the vanadium catalytic converter of Bell et al as the catalytic converter in Cameron.

14. Claims 10, 11, 15-17, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walles et al, US Patent 4,915,912, in view of Esser et al, US Patent 5,677,010.

Walles et al teaches an apparatus for the generation of sulfur trioxide reagent and sulfonation of the surface of polymeric resins that includes: an on-site and on-demand sulfonating gas generator 12 using a chemical feed stock of sulfur trioxide 26; a dry air inlet 29; and a pump 36. Walles et al also teaches that the part itself can be the treatment chamber and the reagent contacts the internal polymer resin surfaces of the part. (Figure 3 and column 9 lines 4-66, specifically lines 6-9 and 22-26)

Walles et al differs from the present invention in that Walles et al does not teach at least one injection nozzle to be inserted into the enclosed vessel for injecting sulfonating gas into the vessel and including means for airtight seal, a manifold for carrying the gas to the inlet, a means for exhausting the gas from within the enclosed vessel, or that the vessel is a gasoline tank.

Esser et al teaches a nozzle for use in a fuel tank coating apparatus that includes: a plurality of injection nozzles 30 which are inserted into a plurality of fuel

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tanks, and includes means for an airtight seal 326, a manifold 362 for carrying the gas to the inlet, and a means for exhausting the gas from within the fuel tank 364. (Entire document)

The motivation for adding the nozzles of Esser et al in the apparatus of Walles is to enable the apparatus to Walles et al to coat the inside of enclosed containers as suggested by Walles et al (column 9 lines 22-26).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the inlet nozzles of Esser et al to the apparatus of Walles et al.

15. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walles et al and Esser et al as applied to claims 10, 11, 15-17, and 44 above, and further in view of Walles et al, US Patent 5,030,399.

Walles et al and Esser et al differ from the present invention in that they do not teach a neutralizing means.

Walles et al ('399) teaches injecting ammonia into the enclosed container as a neutralizing agent. (Column 6 line 51-57)

The motivation for supplying a neutralizing agent to the apparatus of Walles et al and Esser et al is to neutralize any sulfonic acid groups as taught by Walles et al ('399) and is well known in the art.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the neutralizing means of Walles et al ('399) to the apparatus of Walles et al and Esser et al.

16. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walles et al and Esser et al as applied to claims 10, 11, 15-17, and 44 above, and further in view of Cameron, US Patent 5,308,587, and Bell et al, US Patent 5,229,077.

Walles et al and Esser et al differ from the present invention in that they do not teach that the sulfur trioxide ( $\text{SO}_3$ ) gas generator includes a vanadium catalytic converter.

Cameron teaches a  $\text{SO}_3$  gas generator that produces  $\text{SO}_2$  in a furnace 12 and then converts the  $\text{SO}_2$  to  $\text{SO}_3$  through a catalytic converter 240 (figure 3 and the abstract). Cameron does not specify a specific type of catalytic converter.

Bell et al teaches a catalytic converter 54 that uses a bed of vanadium pentoxide 55 to convert  $\text{SO}_2$  to  $\text{SO}_3$ .

The motivation for replacing the gas generator of Walles et al and Esser et al with the gas generator of Cameron is to provide an alternate and equivalent means of generating  $\text{SO}_3$ . The motivation for using the catalytic converter of Bell et al in the apparatus of Cameron is to provide a specific catalytic converter as required by Cameron but only generically taught.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the gas generator of Walles et al and Esser et al with the gas generator with a catalytic converter of Cameron, and to use the vanadium catalytic converter of Bell et al as the catalytic converter in Cameron.

17. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walles et al, US Patent 4,915,912, in view of Esser et al, Donald et al, Cameron, and Bell et al.

Walles et al teaches an apparatus for the generation of sulfur trioxide reagent and sulfonation of the surface of polymeric resins that includes: an on-site and on-demand sulfonating gas generator 12 using a chemical feed stock of sulfur trioxide 26; a dry air inlet 29; and a pump 36. Walles et al also teaches that the part itself can be the treatment chamber and the reagent contacts the internal polymer resin surfaces of the part.

Walles et al differs from the present invention in that Walles et al does not teach a multi-port gas delivery system having individual injection nozzles to be inserted into the plurality of polymeric articles for injecting sulfonating gas into the article and including means for airtight seal, a dry air heater, a manifold for carrying the gas to the individual nozzles, a means for exhausting and recycling the gas from within the enclosed vessel, a means for introducing a neutralizing agent, or that the sulfur trioxide ( $\text{SO}_3$ ) gas generator includes a vanadium catalytic converter.

Esser et al teaches a nozzle for use in a fuel tank coating apparatus that includes: a plurality of injection nozzles 30 which are inserted into a plurality of fuel tanks, and includes means for an airtight seal 326, a manifold 362 for carrying the gas to each inlet, and a means for exhausting the gas from within the fuel tank 364. (Entire document)

Donald et al teaches a dry air heater 60 for preheating the dry air prior to mixing with the sulfur trioxide, and a neutralizing means 28 for neutralizing the sulfonic acid groups.

Cameron teaches a SO<sub>3</sub> gas generator that produces SO<sub>2</sub> in a furnace 12 and then converts the SO<sub>2</sub> to SO<sub>3</sub> through a catalytic converter 240 (figure 3 and the abstract). Cameron does not specify a specific type of catalytic converter.

Bell et al teaches a catalytic converter 54 that uses a bed of vanadium pentoxide to convert SO<sub>2</sub> to SO<sub>3</sub>.

The motivation for adding the nozzles of Esser et al to the apparatus of Walles et al is to enable the apparatus to Walles et al to coat the inside of enclosed containers as suggested by Walles et al (column 9 lines 22-26). The motivation for adding the dry gas preheater of Donald et al to the apparatus of Walles et al is to preheat the dry gas. The motivation for supplying a neutralizing agent to the apparatus of Walles et al is to neutralize any sulfonic acid groups as taught by Donald et al and is well known in the art. The motivation for replacing the gas generator of Walles et al with the gas generator of Cameron is to provide an alternate and equivalent means of generating SO<sub>3</sub>. The motivation for using the catalytic converter of Bell et al in the apparatus of Cameron is to provide a specific catalytic converter as required by Cameron but only generically taught.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the plurality of nozzles of Esser et al, the gas heater and neutralizing means of Donald et al; and to replace the gas generator of

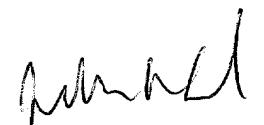
Walles et al with the gas generator with a catalytic converter of Cameron, and to use the vanadium catalytic converter of Bell et al as the catalytic converter in Cameron.

***Conclusion***

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (703) 308-1796. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Jeffrie R. Lund  
Primary Examiner  
Art Unit 1763

JRL  
September 25, 2003